nearly 130,000*l.* a year in furtherance of a definite end. Here it is the provision or supplementing of pensions for the teachers of institutions of university rank. The trustees' report is as interesting and informing as ever. The glimpses one gets into the heart of higher education in the States offer some comfort to the Englishman who is inclined to lament what he may call the mediævalism of our ancient universities. After all, there is in the States the Brown University, the governing body of which must contain a majority of Baptists; the same denomination also controls the destinies of the great University of Chicago, the president and two thirds of the trustees of which must conform. Neither of these institutions can share in the benefits of the Carnegie fund because of their religious restrictions, but, as a result of the existence of that fund, Brown is saving 1,000,000 dollars and Chicago 2,000,000 dollars, each for its own pension purposes.

The report contains a survey of State and municipal schemes for teachers' pensions, which is particularly interesting to us at the present moment. In many, if not in most, States, the "flat-rate" system has been adopted. A pension of 400 dollars after thirty to forty years' service is the normal arrangement. New York is more liberal. It provides pensions equal to one-half the retiring salary after thirty years' service. No pension is to be less than 600 dollars, and none more than 1500 dollars. The upper and lower limits in Boston are 600 and 312 dollars respectively, the basis of calculation within those limits being one-third the annual salary. Philadelphia gives from 400 to 800 dollars on the half-salary basis. Many cities and States have, however, not yet made provision of this kind for the staffs of their public schools, but the movement is progressing, thanks to the example of the Carnegie foundation.

The influence of the foundation has been particularly beneficent in the vexed question of college or university entrance requirements. "The border-line between secondary school and college resembles nothing so much as a species of border warfare," but colleges are steadily changing their standards of admission by requiring the completion of a satisfactory four-year course instead of a certificate of having completed so many "units" of study—a system not unlike that which encouraged elementary-school teachers to pile up as many South Kensington science certificates as possible, in order to increase their chances of promotion.

Nothing illustrates more effectively the good which this annual survey of higher education in the States is exerting than the chapters on "Advertising as a Factor in Education," "Education and Politics," and "Sham Universities." Readers of American journals know something of the first, but probably they have not realised the full extent of the evil. The examples pilloried in this chapter come as a violent shock to our sense of academic decorum. The trustees think the use of pictorial and coloured circulars by universities and colleges is distinctly limited, and they see objections to the practice of printing academic biographies of professors in the college prospectus, but Reed College at Portland, Oregon, exceeds all bounds by including in these biographies "editorships of college annuals, class votes on popularity, degrees that are expected, academic biographies of professors' wives, the number of their children, and finally portraits" of the staff. Even this gross breach of academic decency is beaten by McMinnville College, which advertises a "hand-picked" faculty producing "a product second to none in America." But Muskingham College, Ohio, bears the palm in this type of vulgarity. Its alumni include "the most beloved Bible teacher in America." It represents itself as at the geographical centre of the Church (Presbyterian), and prints "a rude cartoon of an old shoe filled and overflowing with riotous students, while a figure in academic costume chases others away with a bundle of sticks." Below the cartoon are verses of which this is a specimen:—

There is a college president, like the woman in the shoe,
Who has so many children that he doesn't know what to do.
He tries to treat them fairly, and give them each some room,
But the college grows so grandly, like a town site on the boom,
That unless her friends soon rally and provide another shoe,
He must say to all new-comers: "Get out of here! Skiddoo!"

Abuses of this kind obviously do much to discredit all that is really good in the higher education of the States.

The Educational Bureau at Washington is also waking up to some well-known evils. The Commissioner has been looking into the question of universities and colleges which confer degrees. He finds only fifty-nine the degrees of which are wholly satisfactory, and 161 where they are approximately so, but the report under review tells us that these are less than a fourth of the institutions in the country which call themselves universities and colleges, all of which grant degrees.

The trustees of this foundation deserve the thanks of the American community for the courageous way in which they are discharging their great trust.

J. A. Green.

NOTES.

As announced already, the dedication of a window in memory of Lord Kelvin will take place in Westminster Abbey on Tuesday, July 15, at 3 p.m. The window, which is the result of action taken by engineers in the British Dominions and the United States, has been placed in the north aisle of the nave, in close proximity to the one erected in 1909 by civil engineers to the memory of Sir Benjamin Baker; and it has been designed and made by the same artist, Mr. J. N. Comper. A special service, with music, is being arranged by the Abbey authorities, and Mr. R. Elliott-Cooper, president of the Institution of Civil Engineers, will make the formal presentation of the window on behalf of the donors. Members of the American engineering societies and of the Canadian Society of Civil Engineers who may be in London at the time are invited to attend the dedication ceremony, whether they subscribed to the cost of the window or not, and they may obtain cards of admission by writing before Monday, July 14, to the secretary of the Institution of Civil Engineers, 12 Dartmouth Street, Westminster, S.W.

THE allocation by the Mansion House Committee of the Scott Fund shows every evidence of a most careful consideration of all the interests involved. The allocation falls under the three main headings of provision for the relatives of those lost (or, in one instance, incapacitated), for the publication of the scientific results, and for memorials. The provision for the relatives includes 8500*l*. each for Lady Scott and Mrs. Wilson, 6000*l*. for Mrs. Scott and her daughters, 4500*l*. for Mrs. Bowers and her daughters, and 3500*l*. in trust for the child Peter Scott, with smaller sums for Evans's family and to meet need in other two cases. The arrangements for publication of the scientific results have failed to commend themselves to one member of the committee, but they can scarcely, on general grounds, be regarded as ungenerous. One of the honorary secretaries of the Royal Geographical Society, Capt. H. G. Lyons, F.R.S., appropriately undertakes their editorship, and representatives of that body and of the Royal Society, with Surgeon Atkinson, will control the work. A total sum of 17,500*l*. provides, besides the cost of publication, for the services of three biologists, three geologists, two physicists, other specialists, and a draughtsman, and the figure of 800*l*.—an ample but not excessive provision—is earmarked for the production of charts and maps. As regards the arrangements for memorials, a tablet in St. Paul's Cathedral is fitting; a group of statuary was doubtless inevitable; it is proposed that it should stand in Hyde Park facing the Royal Geographical Society's house. A contribution to a memorial to Oates, which is being raised by his regiment, is admirable as a special expression of regard for the memory of one whose relatives need no assistance from the fund. The published results of the expedition will not form its only scientific memorial; the establishment of a trust fund of some 10,000*l*. for the endowment of future polar research will perhaps in the long run preserve most honourably the memory of a great scientific expedition, and would, in the belief of the committee, have commended itself greatly to its leader.

THE council of the Royal Society of Edinburgh has awarded the Gunning Victoria Jubilee Prize for the quadrennial period 1908–12 to Prof. J. Norman Collie, F.R.S., for his distinguished contributions to chemistry—organic and inorganic—during twenty-seven years, including his work upon neon and other rare gases. Prof. Collie's early papers were contributed to the Transactions of the society. The council has also awarded the Makdougall-Brisbane prize for the biennial period 1910–12 to Dr. John Brownlee, for his contributions to the theory of Mendelian distributions and cognate subjects, published in the Proceedings of the society within and prior to the prescribed period.

AT a meeting of the electing trustees of the British Museum, held on July 2, Sir Archibald Geikie, K.C.B., P.R.S., was elected a trustee of the British Museum in succession to the late Lord Avebury. Sir A. Geikie was already an *ex-officio* trustee, in virtue of his position as president of the Royal Society; but his tenure of that office comes to an end in November next, and his services would have been lost to the British Museum but for his present election as a trustee for life.

AN association of amateurs interested in wireless telegraphy and telephony has been formed, under the title of "The London Wireless Club." A meeting will be held in September next, for the purpose of electing a committee. The honorary secretary *pro tem.* is Mr. R. H. Klein, 18 Crediton Road, West Hampstead, N.W.

SIR ROBERT LUCAS-TOOTH has given a donation of 1000*l*. to the fund that Capt. J. K. Davis is raising in this country for Dr. Mawson's Australasian Antarctic Expedition. We learn from *The Times* that Capt. Davis leaves England on July 18 for Australia. On his arrival there the *Aurora* will be refitted and will proceed to Commonwealth Bay to bring back Dr. Mawson and his six companions at present in the Antarctic.

THE discussion by a Standing Committee of the House of Commons of the Bill to prohibit experiments on dogs was continued on July 2. As was pointed out in our issue of last week, the Bill proposes to enact that it shall be unlawful to perform any experiments of a nature causing or likely to cause pain or disease to any dog for any purpose whatsoever, either with or without anæsthetics. At the Committee meeting on July 2 an amendment was carried that the Bill should apply only to inoculation experiments. The Bill is again under consideration by the Committee as we go to press.

THE annual conference of the Museums Association, which is to be held at Hull this year, will open on Monday next, July 14, under the presidency of Mr. E. Howarth, curator of the Sheffield Public Museums and Art Gallery. Many interesting subjects are to be discussed, among them being the possibility of showing our museums and art galleries to the blind, arising out of experiments made by Mr. J. A. Charlton Deas, at Sunderland Museum and Art Gallery. The peripatetic guides at the British Museum (both Bloomsbury and South Kensington) will attend to give their experiences in the personal conduction of visitors around these institutions, and Prof. Rathgen, of Berlin, is to discourse on the decay and preservation of antiquities. The local secretary for the meeting is Mr. Thos. Sheppard, of the Hull Museum. The secretary of the association is Mr. E. E. Lowe, curator of the Leicester Museum and Art Gallery.

THE Institut de Paléontologie Humaine, founded by Albert I., Prince of Monaco, has issued a report of the investigations conducted in 1912 by MM. Breuil and Obermaier. The most interesting discoveries are two fine examples of the decorated staves called by French archæologists *batons de commandement*, from Spanish caves; a rough delineation of an animal, perhaps a horse, and a male human figure from the grotto of San Garcia in Burgos; and a remarkable series of figures from the Sierra Morena and Velez Blanco caves, illustrating the evolution of design in a female idol of the early Neolithic age. The explorers record their obligations to an English antiquarian, Col. Willoughby Verner, for his researches in the Peleta cave at Benaojan, Malaga, and describe the visit of M. Breuil, under the guidance of Prof. Sollas, to the well-known Bacon Hole, near Swansea, which corroborated the identification of the Palæolithic drawings on its walls.

AMERICAN archæologists, having settled the main problems which the continent presents, are now devoting themselves to regional, intensive exploration. Mr. Clark Wissler has recently issued in Bulletin 9 of the Geological Survey of New Jersey a preliminary report on archæology. The surface sites so far reported are rare except in restricted areas, which correspond with the distribution of the Lenápé Indians during the early settlement period, and it thus appears that all such remains belong to the historic Indians and their immediate ancestors. No positive traces of a pre-Indian culture have been discovered. Long lists and descriptions of the remains are given, classified as camp and village sites, shell-heaps, cemeteries, rock shelters, quarries, caches, and trails, the camp and village sites being most abundant. Stone implements are abundant, but as regards palæoliths, though the existence of such seems to have been demonstrated by Volk in the Delaware Valley, some archæologists are not satisfied that they are human in origin.

WE have received the Livingstone College Year Book for 1913, which gives particulars of the work done there, extracts from the letters of old students, &c. The college is established for the training of missionaries in the elements of medicine and hygiene. An appeal is made for 10,000*l*. for paying off a mortgage on the property and establishing a small endowment fund.

PARTS 1 and 2 of *Mikrokosmos* (7 Jahrg., 1913–14) contain several well-illustrated articles of interest to microscopists, *e.g.* a simple illuminating apparatus, a new form of mechanical stage, preparation of material, development of protozoa, &c. Herr Günther and Dr. Stehli contribute lists of common plants in suitable condition during April and May for the demonstration of special structures, &c., which are indicated, with their habitat.

A NINTH research report, by Dr. Houston, director of water examination, has been issued by the Metropolitan Water Board. It deals with a search for the typhoid bacillus in *raw* river water and crude sewage, and is a continuation of the author's former investigations on the same question (see second, fifth, and seventh research reports). Twenty-eight samples of crude sewage were examined, mostly from Barking or Hendon, also from Dublin, Belfast, Edinburgh, and Aberdeen, but in no case was the typhoid bacillus detected. Dr. Houston concludes that the home of the typhoid bacillus is not so much in impure water, or even in the crude sewage from a large community, as in the "factories" of disease, as exemplified by the "carrier" case.

AMONG the cases referred to in a recent batch of Opinions (52 to 56) issued by the International Commission on Zoological Nomenclature at Washington is that of the rodent genus Ondatra, frequently considered as applicable to the South American coypu, commonly known as Myocastor or Myopotamus. In the opinion of the majority of the committee this usage is, however, considered erroneous, the name really belonging to the musk-rat, originally described as *Mus zibethicus*.

To the May number of *The National Geographic Magazine* Mr. E. C. le Munyon communicates a richly illustrated account of his experiences in conveying a motor-car for the use of the Tasha-Lama from Tientsin across the Gobi to Urga, in northern Mongolia. One of the plates shows a vast flock of sheep, probably of the Hunia breed, on the march to Pekin, whence a large quantity of the wool—which is chiefly employed in carpet-making—is exported to America. The author also encountered enormous herds of wild horses and "antelopes," the latter being doubtless the Mongolian gazelle or one of the allied species. It may be added that the motor reached its destination in excellent working order.

A PAPER by Prof. A. Keith on the teeth of prehistoric man is published in the Odontological Series of the Proceedings of the Royal Society of Medicine, vol vi. After noticing certain variations from the modern type characteristic of many prehistoric molars, the author proposes the term "taurodontism" for the modification in which the crown tends to become excessively wide in proportion to the root, while "cynodontism" is suggested for the opposite condition. Taurodontism is stated to be excessively developed in Neanderthal man, whose teeth, although primitive or simian in some features, are regarded as highly specialised in others; the dentition of the Galley Hill man is, however, regarded as still more simian in character.

IN an article in the June number of *The Zoologist* on his experiences of hunting the hump-backed whale from one of the two whaling stations at Durban, Mr. T. B. Goodall directs attention to what he regards as a misinterpretation of the relationship of the plates of whalebone to the plate in the whalebone-whales. It is generally stated in text-books that these plates are outgrowths of ridges on the palate, comparable to the rugæ on that of cattle. Mr. Goodall states, however, that the plates arise on the outer sides of two median raised ridges of mucous membrane, which can apparently be raised or depressed. These ridges, or folds, he thinks, probably represent the gums, although it is also suggested that they may correspond to the upper lips. In consequence of this, the plates of whalebone, according to the author, appear to be quite distinct from the palate, and to be outside the gums and inside the cheeks, or, on the hypothesis that the longitudinal folds are the upper lips, the plates "are really modified hairs of a veritable moustache on an inverted upper lip." It is added that the weight of one of these whales is computed at a ton to the foot, so that a 60-ft. humpback would weigh 60 tons. A newly-born humpback is stated to have measured 16 ft. in length, and to have weighed a couple of tons.

DR. GERTRUD TOBLER has given an elaborate account of the genus Synchytrium in her recently published work, "Die Synchytrien: Studien zu einer Monographie der Gattung" (Jena: G. Fischer, 5 marks). The group (Chytridiales) to which this genus belongs includes the most interesting of the lower fungi, and Frau Tobler's detailed studies include its morphology, cytology, development, influence on the host plants, and geographical distribution, together with systematic descriptions of the fifty-one recognised species and a list of their host plants. The work also includes a historical summary and a full list of literature, and there are four plates.

THE greater portion of tome 25, No. 4, of the *Bulletin de la Société Impériale des Naturalistes de Moscou* is occupied by two papers on the mechanical tissues of plants. In the first paper W. Rasdorsky gives a useful historical summary of previous work on this subject between 1873 and 1910, and of the present state of knowledge concerning the mechanics of vegetable tissues in both flowering and flowerless plants. In the second paper this author and I. A. Kalinnikow give a long account of their own researches with apparatus devised by themselves for testing the strength of fibres and other tissues. The results are set forth in numerous tables and diagrams, relating chiefly to experiments with the stalks and blades of palm leaves and with various kinds of iron and steel. Plant fibres were found to have about the same tensile strength as wrought-iron, and in some cases approached that of steel, while they greatly exceed iron and steel in elasticity, though falling far short of these metals in ductility.

A COPY has reached us of the first report of the Forest Branch of the Department of Lands, British Columbia. This branch was created in February, 1912, and the result of the first year's work reflects great credit upon the Chief Forester, Mr. H. R. Macmillan, and his assistants. British Columbia contains one of the few great bodies of commercial timber left in the world which are not yet materially reduced by destructive lumbering, and, with the possible exceptions of Siberia, Brazil, and the north-western United States, the timber wealth of British Columbia is unparalleled in any other country, since it contains not less than one hundred million acres of forest land. At the present rate of cutting, making no allowance for annual growth, it would take nearly 250 years to use up merely the mature timber now standing; the annual growth of the forests is even now, though they are not yet adequately protected against fire and waste, not less than five times the present annual cutting. Great stress is laid on the need for a prudent policy of forest utilisation and protection, including the formation of forest reserves in such areas as are unsuited for agricultural use. The report is illustrated by thirty-three very fine photographs, which, besides their immediate purpose, serve to convey an admirable impression of the forest vegetation of the province in its ecological aspects.

THE useful ice reports contained in the meteorological chart issued by the *Deutsche Seewarte* for the North Atlantic Ocean for July show that early in June a great quantity of drift ice was still met with, especially north of latitude 45° N., where the Newfoundland Bank and the district to the east of it, as far as longitude 41° W., were thickly beset with bergs. South of latitude 45° N. the difficulties were not so great; drift ice had much increased since the previous month, but a further advance of the ice southwards was not observed. Two bergs were sighted on June 7, so far south as 43·1° N., 42·8° W., and the possibility of a further advance would naturally have to be taken into account.

THE valuable publication entitled *Deutsche überseeische meteorologische Beobachtungen,* vol. xxi., containing data for 1911, is issued by the Seewarte, as in previous years, with the assistance of the Imperial Colonial Office, the results being prepared with much care by Dr. P. Heidke. The volume is considerably enlarged compared with that of the previous year (NATURE, August 22, 1912) by the addition of observations at definite hours at some stations in the Cameroon district and in German South-West Africa. The discussion and publication of observations for the Protectorate of German New Guinea, and for several islands in the Pacific Ocean, are also contemplated. The volume forms a most important contribution to our knowledge of the climatology of many remote regions.

WE have received from Dr. Louis Bell, whose book on illumination is so well known, a copy of a note he communicated to *The Electrical World* for May 24 on silvered mirrors and their preservation. It appears that the method of covering a silver mirror with a thin layer of collodion, first suggested by M. Perot in the *Comptes rendus* for November, 1909, may be carried out by applying the ordinary lacquer supplied commercially for protecting silverware. Dr. Bell uses clear "Lastina" lacquer diluted with two parts of the thinner provided with it, and floods the mirror with the solution. On drying, the mirror has lost about 4 per cent. of its reflecting power. A still more dilute solution was used for the 2-ft. parabolic speculum reflector of Harvard Observatory. The definition was unimpaired, and after three months of regular service the mirror had only diminished slightly in brilliancy.

THE part of the Proceedings of the Physical Society of London dated June 15 has reached us. We note that the Proceedings are now issued at intervals of two months. The present part consists of more than ninety pages, and contains twelve papers communicated to the society between March 7 and May 8. Each paper is accompanied by an abstract and by a short account of the discussion which followed the reading of it. Mr. T.

Smith's contribution to the discussion of Mr. W. R. Bower's paper on a graphical method of optical imagery covers five pages, and contains all the essentials of Gauss's analytical method and an example of its use. A paper by Dr. W. H. Eccles deals with the important question of the cause of the behaviour of the light electrical contacts used as detectors in wireless telegraphy. Dr. Eccles shows that nothing further is required to explain the behaviour of the different types of contacts than the laws of generation of heat in conductors by electric currents and the laws of thermo-electricity.

In a short note in the *Gazzetta Chimica Italiana* (vol. xliii., i., 197) Mr. A. Pieroni describes a new method of preparing colloidal solutions, which consists in dissolving, for instance, silver nitrate or copper sulphate in pyridine containing pyrogallol or tannic acid, and subsequently diluting with water. Under these conditions, colloidal solutions of copper or silver are obtained which are much more concentrated than colloidal solutions of the same metals in water only; in the case of silver, for instance, relatively stable solutions, containing 0·05 to 0·064 per cent. of the metal, can be obtained.

We have received from the United Tanners' Federation of Great Britain and Ireland a copy of "The Tanners' Yearbook" (3*s*., post free), which, besides containing a report of the work of the central committee of the Tanners' Federation during 1912, contains statistics of leather and of materials employed in the leather industry, and a number of articles on matters of technical interest. Some of these are of scientific importance; for instance, the article on the mimosa-bark industry of South Africa, by Dr. J. Gordon Parker, and that on the new synthetic tannin, "Neradol D," manufactured by the Badische Co., Ltd.

The Journal of the Marine Biological Association (vol ix., No. 4) contains an important paper by the late Mr. G. H. Drew on the precipitation of calcium carbonate by marine bacteria. Evidence is brought forward to show that the chalky mud flats forming the Great Bahama Bank and those which are found in the neighbourhood of the Florida Keys are now being precipitated by the action of a new bacterium, to which, owing to its power of precipitating calcium carbonate from dilute solutions of calcium salts, the name *Bacterium calcis* is given. The isolation and characteristics of the bacterium are described and the hypothesis put forward that in the formation of the various chalk and oolite strata the *Bacterium calcis* or similar bacteria have played an important part, as well as the Foraminifera and larger organisms; if such a view be correct these strata must have been deposited in comparatively shallow water, the temperature of which approximated to that of the modern tropical seas.

The second Gustave Canet lecture, delivered by Dr. Dugald Clerk, before the Junior Institution of Engineers, on June 30, dealt with the present state of our knowledge of the working fluid of internal-combustion engines. The combined work of English and Continental physicists and engineers has thrown much light upon the physical and chemical behaviour of flame, and it is now possible to give an approximately accurate account of the leading phenomena of combustion, explosion, and expansion, so far as concerns the engineer. Dr. Clerk gave a useful summary, together with the principal results, of modern experiments on temperatures in the gas-engine cylinder, on the internal energy of gas-engine mixtures, on explosions in closed vessels, on turbulence, and on radiation. With the view of testing the accuracy of the data thus accumulated, there are several trials on gas-engines included, together with the reduction of the results. The information thus given presents a very full statement of our knowledge, as might be expected from Dr. Clerk's personal connection with the British Association committee formed in order to study this subject. In Dr. Clerk's opinion, practical men very greatly underrate their indebtedness to theory. Some practical men have gone so far as to say that gas-engine designers have brought internal-combustion engines to their present state of efficiency without any aid from scientific theory. The increasing efficiency of the internal-combustion engine has put great pressure upon steam-engine builders, and recent steam turbine efficiencies have attained such figures that it becomes necessary for the gas-engine designer to attempt further economies in order to keep ahead of his steam rival. This he can do only by exact knowledge of his heat losses and properties of his working fluid.

We have received from Messrs. Gallenkamp and Co., 19 and 21 Sun Street, E.C., a catalogue of laboratory outfit for the bacteriological and pathological laboratory. All the general and special apparatus, as well as the necessary fittings, are included in the list, which is fully illustrated.

Catalogue No. 319, just issued by Mr. E. Baker, 14 and 16 John Bright Street, Birmingham, includes a number of rare and interesting works on many branches of science, offered at low prices. Librarians and others requiring volumes to complete sets or series, or papers on particular subjects, should see the catalogue.

Three new volumes in Prof. Ostwald's series of scientific classics—"Klassiker der exakten Wissenschaften"—published by Mr. W. Engelmann, of Leipzig, have recently been received. No. 188 (price 1.80 marks) is entitled, "Die Druckkräfte des Lichtes," and contains two papers by P. Lebedew on the pressure of light, with notes by P. Lasareff. A translation into German of A. C. Clairaut's work, published in 1743, on the theory of the shape of the earth, based upon hydrostatic principles, appears as No. 189 (price 4.60 marks), under the title, "Theorie der Erdgestalt nach Gesetzen der Hydrostatik," with notes by P. E. B. Jourdain and A. v. Oettingen. Similar valuable notes are contributed by R. Anschütz to No. 190 (price 5 marks), which contains J. Loschmidt's "Konstitutions-Formeln der organischen Chemie in graphischer Darstellung." Each of the volumes has a portrait of the original author as a frontispiece.